

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Original claims 1-38 (cancelled).

Claim 39 (new): An air treatment device comprising:
a housing including an air inlet and an air outlet;
a fan for stimulating an airflow through the housing from the air inlet to the air outlet; and

a UV treatment chamber downstream relative to said air inlet, the UV treatment chamber including at least one UV radiation source for exposing said airflow to UV radiation for killing a microorganism present in said airflow.

Claim 40 (new): The air treatment device according to claim 39, further comprising at least one filter upstream relative to the UV treatment chamber for removing particles and microorganisms having a size larger than a predetermined filter diameter from said airflow before exposing said airflow to said UV radiation.

Claim 41 (new): The air treatment device according to claim 40, further comprising:

a dust filter downstream relative to the air inlet for removing large dust particles from said airflow; and

a HEPA filter downstream relative to the dust filter for removing small dust particles and large microorganisms from the airflow.

Claim 42 (new): The air treatment device according to claim 40, further comprising a carbon filter downstream relative to the air inlet for removing dust particles and microorganisms from said airflow.

Claim 43 (new): The air treatment device according to claim 40, wherein a filter UV radiation source is provided for irradiating UV radiation on at least one of said at least one filter.

Claim 44 (new): The air treatment device according to claim 39, wherein the fan is positioned upstream relative to the UV treatment chamber such that the airflow in the UV treatment chamber is substantially turbulent.

Claim 45 (new): The air treatment device according to claim 40, further comprising a cooling unit downstream relative to said at least one filter for cooling, and dehydrating by cooling, the airflow.

Claim 46 (new): The air treatment device according to claim 45, further comprising a humidity sensor disposed downstream relative to the cooling unit, and a processing device which receives humidity data from said humidity sensor, with the processing device controlling the cooling unit to provide a predetermined humidity in the UV treatment chamber.

Claim 47 (new): The air treatment device according to claim 46, wherein the humidity sensor is disposed in the UV treatment chamber.

Claim 48 (new): The air treatment device according to claim 45, further comprising a first temperature sensor disposed downstream relative to the cooling unit, and a processing device which received first temperature data from said first temperature sensor, with the processing device controlling the airflow rate by controlling a fan speed, to provide a predetermined temperature of the air leaving the UV treatment chamber.

Claim 49 (new): The air treatment device according to claim 48, wherein the temperature sensor is disposed immediately downstream relative to the UV treatment chamber.

Claim 50 (new): The air treatment device according to claim 39, further comprising an ionizer, which is located downstream relative to said at least one filter, for providing an electron stream substantially perpendicular to the direction of airflow.

Claim 51 (new): The air treatment device according to claim 45, further comprising an ionizer, which is located downstream relative to the cooling unit, for providing an electron stream substantially perpendicular to the direction of airflow.

Claim 52 (new): The air treatment device according to claim 39, further comprising a second carbon filter located downstream relative to said at least one filter.

Claim 53 (new): The air treatment device according to claim 45, further comprising a second carbon filter downstream relative to said at least one filter, the carbon filter and the cooling unit being combined in one unit.

Claim 54 (new): The air treatment device according to claim 39, wherein an inner wall of the UV treatment chamber is provided with a UV radiation reflecting layer.

Claim 55 (new): The air treatment device according to claim 54, wherein the reflecting layer consists of aluminum.

Claim 56 (new): The air treatment device according to claim 54, wherein the reflecting layer has a rough surface such that reflected UV radiation is scattered.

Claim 57 (new): The air treatment device according to claim 54, wherein the reflecting layer is formed by sputtered aluminum.

Claim 58 (new): The air treatment device according to claim 39, further including a second UV radiation source provided with a second temperature sensor and a processing device which receives second temperature data from said second temperature sensor, said processing device controlling a power output of said at least one UV radiation source for protecting the at least one UV radiation source from undercooling or overheating.

Claim 59 (new): The air treatment device according to claim 39, further comprising at least one microorganism sensor for determining a number of microorganisms present in the air passing said microorganism sensor.

Claim 60 (new): The air treatment device according to claim 59, wherein said microorganism sensor is connected to a processing device, the processing device controlling the air treatment device in response to the determined number of microorganisms.

Claim 61 (new): The air treatment device according to claim 59, comprising a first microorganism sensor provided immediately downstream of the air inlet and a second microorganism sensor provided immediately upstream to the air outlet, with said first and said second microorganism sensors connected to a processing device, the processing device determining a sterilization factor from a determined number of microorganisms present in the air flowing into the air treatment device and a determined number of microorganisms present in the air flowing out of the air treatment device.

Claim 62 (new): The air treatment device according to claim 39, wherein the at least one UV radiation source is disposed in a cover, which cover is transmissive for the emitted UV radiation.

Claim 63 (new): The air treatment device according to claim 62, wherein the cover is made of Teflon.

Claim 64 (new): The air treatment device according to claim 39, wherein the air inlet and the air outlet in the housing are constructed such that no UV radiation may escape from the housing.

Claim 65 (new): The air treatment device according to claim 39, wherein an UV radiation absorbing layer is provided on a wall of the housing.

Claim 66 (new): The air treatment device according to claim 39, wherein the emitted UV radiation of said at least one UV radiation source has a wavelength between 253 nm and 257 nm, preferably a wavelength of 253.7 nm.

Claim 67 (new): The air treatment device according to claim 43, wherein the emitted UV radiation of the filter UV radiation source has a wavelength between 253 nm and 257 nm, preferably a wavelength of 253.7 nm.

Claim 68 (new): An air conditioning system comprising an air treatment device, the air treatment device comprising:

- a housing comprising an air inlet and an air outlet;
- a fan for stimulating an airflow through the housing from the air inlet to the air outlet;
- a dust filter downstream relative to the air inlet for removing large dust particles from said airflow;
- a HEPA filter downstream relative to the dust filter for removing small dust particles and large microorganisms from the airflow;
- a first UV radiation source for irradiating UV radiation on the HEPA filter; and
- an UV treatment chamber downstream relative to said HEPA filter, the UV treatment chamber comprising a second UV radiation source for irradiating UV radiation in said UV treatment chamber.

Claim 69 (new): An air treatment method comprising the steps of:

- (a) generating an airflow; and
- (b) radiating UV radiation for exposing said airflow to said UV radiation for killing a microorganism present in said airflow.

Claim 70 (new): The air treatment method according to claim 69, further comprising filtering particles and microorganisms having a size larger than a predetermined filter diameter from said airflow before exposing said airflow to said UV radiation.

Claim 71 (new): The air treatment method according to claim 69, further comprising dehydrating the airflow before exposing said airflow to said UV radiation.

Claim 72 (new): The air treatment method according to claim 69, further comprising the steps of:

- determining an air temperature of said airflow; and
- controlling an airflow rate in response to said air temperature.

Claim 73 (new): The air treatment method according to claim 69, further comprising generating an electron stream in said airflow, the electron stream being substantially perpendicular to the direction of said airflow.

Claim 74 (new): The air treatment method according to claim 69, further comprising:

determining a temperature of a UV radiation source; and
controlling a power consumption of said UV radiation source for protecting said UV radiation source against overheating or undercooling.

Claim 75 (new): The air treatment method according to claim 69, further comprising the steps of:

determining a number of microorganisms present in said airflow; and
controlling at least one of an airflow rate, hydration level and a radiation source power consumption in response to the determined number of microorganisms.

Claim 76 (new): The air treatment method according to claim 75, further comprising the steps of:

determining an input number of microorganisms present in said airflow before exposing said airflow to said UV radiation;

determining an output number of microorganisms present in said airflow after exposing said airflow to said UV radiation; and

determining a sterilization factor from said input number of microorganisms and said output number of microorganisms;

wherein said at least one of an airflow rate, hydration level and a radiation source power consumption is controlled in response to said sterilization factor.